Balanced Assessment *in* Mathematics

8

These tasks give you a chance to show how you reason and solve mathematical problems.

Please show your work and reasoning in the spaces provided.

Name: _____ Male Female

School: _____ City: _____

Teacher: _____ Grade: _____

Date: _____

Do not write in the box below:

8	Jane's TV 6	A New Car 9	Multiples of Five 8	Making The Grade 9	Matchsticks 8	Total 40
11						

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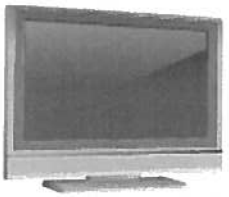
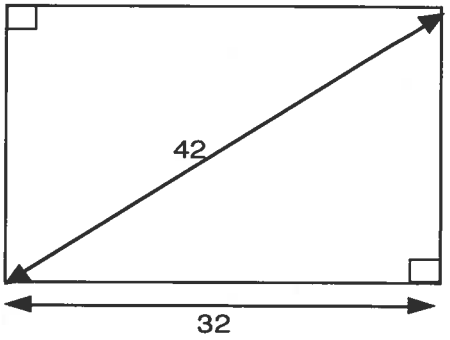
Jane's T.V.

This problem gives you the chance to:
- use the Pythagorean theorem



Jane is hoping to buy a large new television for her den, but she is not sure what size screen will be suitable for her wall. Television screens are rectangular, but when they are on sale they are measured by the length of their diagonal.

This 42 inch screen measures 32 inches along the base.



1. What is the height of the screen? _____

   Show how you figured this out.

2. What is the area of the screen? _____square inches

3. Jane would like to have a screen 40 inches wide and 32 inches high.
   About what size screen will she need to buy? _____inches
   Show how you figured this out.

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A New Car

This problem gives you the chance to:
- read information from box plots
- draw a box plot

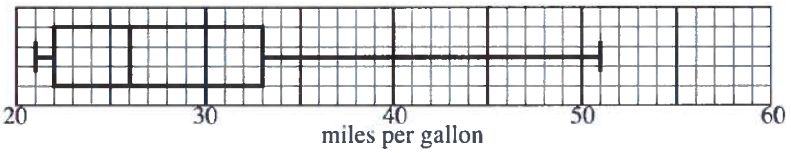
Jason's dad is planning to buy a new family car.
Jason wants his dad to buy a car that is kind to the environment and has a small carbon footprint.

Jason's mum uses the car around town but his dad wants good miles per gallon on long journeys too.

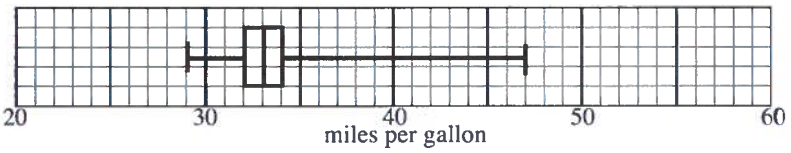
Jason has made a list of 15 cars that they are considering, and he has looked up the number of miles per gallon and their carbon footprints.

Jason has drawn box plots showing the number of miles per gallon for in the city and on the highway.

Miles per gallon in the city



Miles per gallon on the highway



1. Jason's dad says "we should buy a car with better than average miles per gallon".

   Using the median as the average, what fuel consumptions will Jason's dad be looking for?

   More than _____ miles per gallon in the city.

   More than _____ miles per gallon on the highway.

2. Compare the range in the number of miles per gallon in the city and on the highway for these 15 cars.

   _____

   _____

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3. This is a list of the carbon footprint values for the cars measured in tons of CO_2 per year:

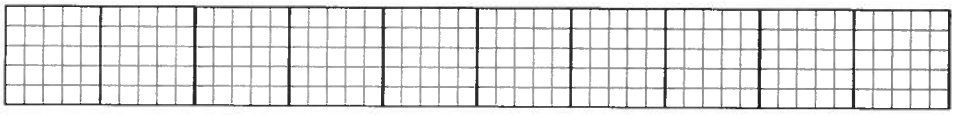
3.7, 4.7, 5.4, 5.4, 6.1, 6.3, 6.4, 6.6, 6.8, 7.1, 7.1, 7.3, 7.3, 7.7, 7.8

Find the five-number summary for this data.

minimum value _____ , maximum value _____ , median _____ ,

lower quartile _____ , upper quartile _____.

4. Draw a box plot to show this data.
Do not forget to label your box plot.



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Multiples of Five

This problem gives you the chance to:
- test number statements to see if they are true
- justify and find examples to support your answer

P is a multiple of 5.
Q is a different multiple of 5.

Check (√) each of the following statements according to whether you think it is **always true**, **sometimes true**, or **never true**.

	always true	sometimes true	never true
Statement 1 The sum of **P** and **Q** is a multiple of 10.			
Statement 2 The difference between **P** and **Q** is a multiple of 5.			
Statement 3 The product of **P** and **Q** is a multiple of 25.			

For each statement, give at least two examples to support your answer.
If a statement is **always** or **never** true, justify your answer. Use algebra if possible.
If a statement is **sometimes true**, give one example for which it is true, and one for which it is not.

Statement 1

Statement 2

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Statement 3

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Making the Grade

This problem gives you the chance to:
- calculate percentages
- round to the nearest whole number
- calculate a mean

Mrs. Sinise is working out the grades for her math class.
During the semester they have had six test papers.

On one of the tests students could get **15 points**.

On the test Anna got **9 points** and Dick got **7 points**.

1. Figure out what percentages Anna and Dick got for this test.
   Give your answers to the nearest whole number.
   Show how you figured it out.

Anna _____ %

Dick _____ %

2. The table shows the total possible points for each test and the points that Anna got on the tests:

Total	**25**	**50**	**20**	**30**	**20**	**15**
Anna	18	29	14	22	12	9

By adding all the test points together work out what overall percentage Anna got in math this semester.
Show how you figured it out.

Anna _____ %

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3. After each test Mr. Gibbs figured out the percentage for each student in his math class and uses this table to work out their grades.

Grade	A	B	C	D	E
Percentage	$p \geq 70\%$	$70\% > p \geq 62\%$	$62\% > p \geq 54\%$	$54\% > p \geq 44\%$	$p < 45\%$

These are the percentages that Kara got in the tests. Fill in Kara's grades.

Percentage	58%	53%	62%	59%	55%	66%
Grade						

4. Mr. Gibbs works out the students' grades for the semester by finding the mean of the percentages and giving the grade from the table.

What grade did Kara get for the semester?
Show how you figured it out. _____

5. These are the percentages and grades that Randy got.

Percentage	72%	54%	70%	73%	75%	62%
Grade	A	C	A	A	A	B

Randy expects to get a grade A for math this semester because he got grade A in most of his tests.

When Mr. Gibbs figured out Randy's grade, it was a B.

Explain why Randy's grade was lower than he expected.

_____

_____

_____

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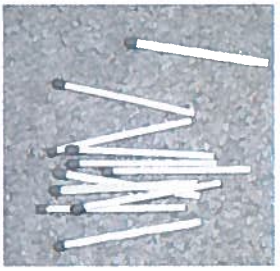
Matchsticks

This problem gives you the chance to:
• work with volume in a real life situation



Matchsticks are rectangular prisms of wood measuring approximately $\frac{1}{10}$ inch by $\frac{1}{10}$ inch by 2 inches.

1. What is the volume of a matchstick? _____
   Show your calculation.

2. A tree trunk can be thought of as an approximate cone of wood.

   The volume of a cone is found using the formula $\frac{1}{3}\pi$, where r feet is the radius of the base of the cone and h feet is the height of the cone.

   How many matchsticks can be made from a tree with a trunk with a base radius of 1 foot and a height of 80 feet?
   Show your work. _____

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